



Geotechnical Laboratory
PO Box 4339
1570 Bear Creek Road
Oak Ridge TN 37830
865/482-6497

CERTIFICATE OF ANALYSIS

Stephen Trent
Fluor Hanford, Inc.
825 Jadwin Avenue
Richland, Washington 99352

October 26, 2004

This is the Certificate of Analysis for the following samples:

Shaw Project ID:	Eberline - Hanford
Shaw Project Number:	100846.18000000
Client Sampling Authorization Form No.	F04-025-164 F03-025-164 <i>Daynes</i>
Client Sample Data Group:	H2714 <i>10/28/04</i>
Date Received by Lab:	September 15, 2004
Number of Samples:	One (1)
Sample Type:	Soil

I. Introduction/Case Narrative

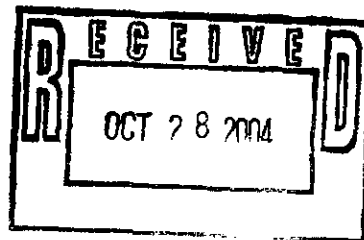
One soil sample was received by the Shaw Geotechnical Laboratory on September 15, 2004. The sample was submitted for determination of bulk density and sieve analysis. The sample number received was B19444.

Please see Appendix A, Sample Number Cross Reference List; Appendix B, Analysis Results; and Appendix C, Chain-of-Custody/Sample Receipt Records.

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Reviewed and Approved:

Ralph Cole
Laboratory Manager, Geotechnical Services



0000001

II. Analytical Results/Methodology

REFERENCES: United States Army Corps of Engineers (USACE), Engineer Manual 1110-2-1906, *Laboratory Soils Testing*, appendix II, 1970; United States Environmental Protection Agency, SW846, *Test Methods for Examining Solid Waste, Physical/Chemical Methods*, 3rd ed., Nov 1986 (EPA SW-846). Annual Book of ASTM Standards, Section 4, Construction, Volume 04.08, *Soil and Rock (I)*, and Volume 04.09, *Soil and Rock (II)*, 2004. Shaw Environmental and infrastructure, Standard Operating Procedures.

Moisture Content of Soil and Rock..... **ASTM D 2216**
Bulk Density of Soils..... **EM 1110-2-1906**
Particle-size Analysis of Soils **ASTM D 422**

III. Quality Control

Quality control checks such as duplicates and spikes (QC samples), are not normally applicable to geotechnical testing. This is due largely to the inability of obtaining samples with known characteristics, the heterogenous nature of the samples, and quality control procedures built-in to the analytical method.

QC measures to ensure accuracy and precision of test results include the following:

- 100% verification of all numerical results - raw data entries, transcriptions and calculations entered by lab technicians are checked, recalculated and verified. Most data calculations are performed by computer programs.
- Data validation through test reasonableness - summaries of all test results for individual reports are reviewed to determine the overall reasonableness of data and to determine the presence of any data that may be considered outliers.
- Quality control procedures are built into most standardized geotechnical procedures. For example, liquid limit and plastic limit analyses call for re-analyses and specify acceptance criteria.
- Routine instrument calibration - instruments, gauges and equipment used in testing are calibrated on a routine basis. All instrument calibration follows ASTM or manufacturer guidelines.
- Maintenance of all past calibration records - calibration records and certification documents of all instruments, gauges and equipment are updated routinely and maintained in the Quality Control Coordinators Quality/Operations files.

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Shaw Project Name: Eberline Hanford
Shaw Project No. 100846.18000000
SAF No. F04-025-164
SDG No. H2714

**Shaw Geotechnical
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- Certified and trained personnel - all technicians are certified by the National Institute for Certification of Engineering Technicians (NICET) in geotechnical soil testing, and are trained in the application of standard laboratory procedures for geotechnical analyses as well as the quality assurance measures implemented by Shaw.
- Quantitative analyses frequently used in geotechnical/physical testing programs do not use QC tools common to wet chemistry or radiochemistry laboratories. Measures not employed in the analysis of samples reported in this report include: laboratory control samples (LCS), blanks, matrix spikes (MS), duplicate analyses, dilutions, digestions, correction factors, surrogate sample analyses, detection limit determinations, control charts, and/or tentatively identified compounds (TICs).

IV. Data Qualification

None.

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Appendix A
Sample Cross-Reference List

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Stephen Trent
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Shaw Project Name: Eberline Hanford
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**Shaw Geotechnical
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SAMPLE NUMBER CROSS-REFERENCE LIST

LAB SAMPLE NO.	CLIENT SAMPLE NO.	MATRIX
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BC0444	B19444	Soil
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Appendix B
Sample Test Results

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MOISTURE CONTENT

PROJECT NUMBER

100846.18000000

[illegible]

Solids content is determined by subtracting the SW846 moisture (%) from 100.

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**PARTICLE-SIZE DISTRIBUTION
 ASTM D 422**

Project Name Eberline Hanford

Field Sample No. B19444

Project No. 100846.18000000

Lab Sample No. BC0444

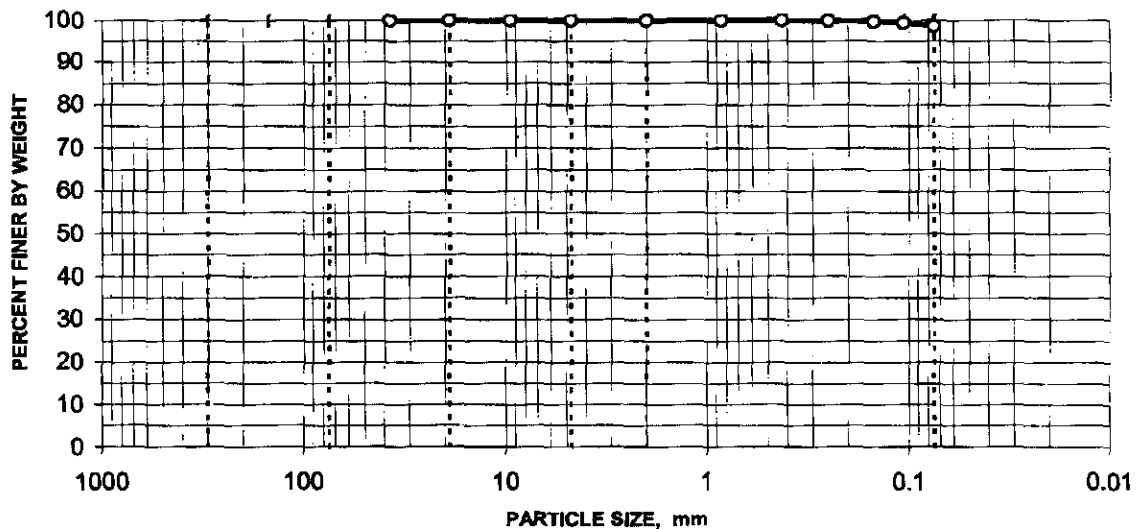
Moisture Content = 22.4%
 based on dry sample weight

SIEVE ANALYSIS

C O A R S E	Sieve No.	Diameter mm	Percent Finer
	3"	75.000	100.0%
	1.5"	37.500	100.0%
	0.75"	19.000	100.0%
	0.375"	9.500	100.0%
	#4	4.750	100.0%
	#10	2.000	100.0%

F I N E	Sieve No.	Diameter mm	Percent Finer
	#20	0.850	100.0%
	#40	0.425	100.0%
	#60	0.250	99.9%
	#100	0.149	99.8%
	#140	0.106	99.4%
	#200	0.075	98.5%

DISTRIBUTION CURVE



0.0% Gravel

1.5% Sand

98.5% Silt/Clay

0000007

100846.18000000

[illegible]

Moisture content calculated by ASTM D 2216 based on sample dry weight.

Bulk density is the weight of wet sample divided by the volume of the wet sample (as-received).

Dry density is the weight of the dry sample solids divided by the volume of the original sample.

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Appendix C
Chain-of-Custody and Request-for-Analysis Records

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FLUOR Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				F03-025-164	PAGE 1 OF 1		
COLLECTOR Pope/Pfister/Hughes/Wiberg		COMPANY CONTACT TRENT, STEVE		TELEPHONE NO. 373-5689		PROJECT COORDINATOR TRENT, SJ		PRICE CODE 8N	DATA TURNAROUND
SAMPLING LOCATION 216-S-20; 158A-160-31 15.5'-15.4' 75g 1-7-04		PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil				SAF NO. F03-025		AIR QUALITY <input type="checkbox"/>	45 Days / 45 Days
ICE CHEST NO. GRP-04-011		FIELD LOGBOOK NO. HNF-N-356 1		COA 119143ES10		METHOD OF SHIPMENT Federal Express			
SHIPPED TO Shaw Group		OFFSITE PROPERTY NO. See PTR 14084				BILL OF LADING/AIR BILL NO. See PTR 14084			
MATRIX* A=Air DL=Drum Liquids DS=Drum Solids L=Liquid O=Oil S=Soil SE=Sediment T=Tissue V=Vegetation W=Water WI=Wipe X=Other	POSSIBLE SAMPLE HAZARDS/ REMARKS N/A Tie to B191H2 Rd Screen SDGA H2714	PRESERVATION		None	None				
		TYPE OF CONTAINER		Moisture Resistant Cont	Liner				
		NO. OF CONTAINER(S)		1	1				
		VOLUME		200mL	1000mL				
SPECIAL HANDLING AND/OR STORAGE N/A		SAMPLE ANALYSIS		Moisture Content - D2216;	SEE ITEM (1) IN SPECIAL INSTRUCTIONS 2724g				
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME						
B19444	SOIL	9-7-04	0705	X	X			BC 0444	
CHAIN OF POSSESSION				SIGN/ PRINT NAMES		SPECIAL INSTRUCTIONS			
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN		DATE/TIME		(1) Particle Size (Dry Sieve) - D422; Bulk Density - D2937;	
B. Pope 9-7-04		1115		M10-026/Fridge #1 9-7-04		1115			
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN		DATE/TIME			
M10-026/Fridge #1 9/9/04		0900		Greg Thomas Aug Thomas 9/9/04		0900			
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN		DATE/TIME			
Greg Thomas Aug Thomas 9/9/04		0900		Fed Ex					
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN		DATE/TIME			
FD 90 9/10/04				AD 90 9/10/04		10:30			
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN		DATE/TIME			
S. J. Shaw 9/14/04		300		Fed Ex 9/14/04					
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN		DATE/TIME			
S. J. Shaw 9-15-04		1000		Paul Shaw 9-15-04		1000			
RELINQUISHED BY/REMOVED FROM		DATE/TIME		RECEIVED BY/STORED IN		DATE/TIME			
S. J. Shaw 9-15-04		1000		Paul Shaw 9-15-04		1000			
LABORATORY SECTION		RECEIVED BY				TITLE			
FINAL SAMPLE DISPOSITION		DISPOSAL METHOD				DISPOSED BY			
						DATE/TIME			
						DATE/TIME			

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QDA-4 H2714
Eberline Svcs

CHAIN OF CUSTODY

ORD # R4-09-070

09/13/04 09:01:36

WORK ID: SAP# F04-025 SDG H2714

RCVD: 09/10/04 DUE: 10/25/04

KEEP: 10/25/05 DISP: S

DASH	SAMPLE IDENTIFICATION	STORED	TESTS
01A-S	B19444	SHAW	DISPOS E331S E333S E335S

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
<i>And Arano</i>	<i>9/14/04</i>	<i>Shaw</i>		<i>And Arano</i>	<i>7.15.04</i>

BC 0444

0000011